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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/527,530	03/11/2005	Takashi Arakane	267416US0PCT	7317

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OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER	
CROUSE, BRETT ALAN	

ART UNIT	PAPER NUMBER
1794	

NOTIFICATION DATE	DELIVERY MODE
06/10/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@oblon.com
oblonpat@oblon.com
jgardner@oblon.com

Office Action Summary	Application No.	Applicant(s)	
	10/527,530	ARAKANE ET AL.	
	Examiner	Art Unit	
	Brett A. Crouse	1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 March 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12* is/are pending in the application.

4a) Of the above claim(s) *2,5,6 and 12* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3,4 and 7-11* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *20090102*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This office action is in response to the amendment, filed 25 March 2009, which amends claims 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 and adds new claims 11 and 12. Claims 1, 3, 4, 8-11 are under consideration.

2. Claim 12 is withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected species, there being no allowable generic or linking claim. Claims 1, 3, 4, 8, 9, 10 and 11 are under consideration.

Response to Amendment

3. The rejection(s) of:

claim 8 under 35 U.S.C. 112, second paragraph

is overcome by the amendment, filed 25 March 2009.

Claim Objections

4. Claim 8 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Amended independent claim 1, from which claim 8 depends, comprises an electron injection layer which both contacts the light emitting layer and cathode. Claim 8 adds an interfacial layer / region to the electron injection layer resulting in a plurality of layers between the light emitting layer and cathode.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1, 3, 4 and 8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Igarashi et al., US 2002/0048689, in view of Sakai et al., 6,486,601, and Liu et al., Synthetic Metals, (2002), Volume 128, Pages 211-214.

Igarashi teaches:

> Paragraph [0092], teaches electroluminescent device layers including light emitting, electron transport, electron injection and a protective layer between a pair of electrodes.
>
> Paragraph [0097], teaches cathode materials and teaches the cathode supplies electrons to the electron injection layer. Examples of cathode materials include lithium and lithium / aluminum and an aluminum / lithium fluoride lamination structure.

Paragraph [0100], teaches compounds in the light emitting layer must also have the ability to transport the charges injected into the layer to move. Benzimidazoles are taught as suitable for the light emitting layer. A guest / host relationship to the material components is also taught.

Paragraphs [0006]-[0044], teach Ir complexes useful in the light emitting layer of an electroluminescent device.

Paragraph [0106], teaches imidazole derivatives are useful in the electron transport and electron injection layers.

Paragraph [0108], teaches materials for a protective layer between the cathode and electron injection layer. Suitable materials include LiF.

Igarashi does not recite:

Igarashi does not recite a reductive dopant in the electron injection layer to form a mixed layer. However, Igarashi recites a multi-layer cathode having a LiF layer adjacent to the electron injection layer. It is noted that instant claim 8 allows the reductive material to be a separate layer / region between the electron injection layer and cathode.

Sakai teaches:

Column 2, lines 55-59, teach an electroluminescent device.

Column 6, line 63 through column 7, line 10, teaches an electron injection layer comprising an organic compound and reductive dopant. Preferable reductive dopants include lithium and cesium.

Column 8, line 63 through column 9, line 7, teach the use of reductive dopants with nitrogen containing heterocycles.

Column 9, lines 9-20, teach preferred nitrogen containing ligands for the formation of the metal complex. Examples include oxadiazoles, thiadiazoles and triazoles.

Column 9, lines 22-38, teach reductive dopant materials. Preferred reductive dopant materials include lithium and cesium.

Liu as further evidence:

Liu is included as evidence of the mechanism by which lithium derivatives function. Page 213 teaches that lithium derivatives act by releasing free lithium.

It would have been obvious to incorporate the reductive dopants of Sakai into the electron injection layer of Igarashi to reduce the drive voltage of the device of Igarashi as suggested by Sakai.

Response to Arguments

7. Applicant's arguments have been fully considered but they are not persuasive.

Applicant argues with respect to the rejection over Igarashi in view of Sakai that the references alone or in combination do not suggest a single electron injection layer between the light emitting layer and cathode which is further doped with a reductive dopant. Applicant points to paragraph [0097] of Igarashi for a teaching of device structure.

Attention is directed to paragraph [0092] of Igarashi which teaches various optional layers available for the formation of an electroluminescent device. Attention is also directed to paragraph [0124], example 4, which teaches a device comprising a light emitting layer/electron injection layer/cathode. It is noted that dependent claim 8 allows for an electron injection layer and separate reductive material layer. Igarashi in paragraph [0097] provides various cathode structures including a multi-layer laminate cathode comprising a LiF layer which meets this structure. An optional protective layer which can comprise LiF is taught by Igarashi in paragraph [0108] which also results in this device structure.

Sakai as added to Igarashi teaches the combination of a reductive dopant and nitrogen containing electron transporting compound to form a mixed layer.

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brett A. Crouse whose telephone number is (571)-272-6494. The examiner can normally be reached on Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, D. Lawrence Tarazano can be reached on 571-272-1515. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/B. A. C./
Examiner, Art Unit 1794

/D. Lawrence Tarazano/
Supervisory Patent Examiner, Art Unit 1794